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THE HISTORY AND CULTURE OF FOOD

Senior Honors Thesis
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April 28, 2006

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I. The Products

The History of Beer Or Why the Dark Ages Were That Way

The average modern beer-drinker probably doesn't consider the origins of brewing while enjoying a cold one. However, if he became inspired by his beverage enough to look into the topic, he would discover that beer-drinking is an ancient practice with its own influence on world history.

While an exact date will probably never be known, brewing most likely began around 4,000 BC in Egypt. Discovery of ale came from bread-making—early ales were made by allowing partially baked bread to soak in water for about a day. The Egyptians passed brewing knowledge on to the Greeks, who taught the Romans, who taught people all over Europe how to make ale. The addition of hops, discovered in the early 15th century, acted as a preservative and gave beer bitter flavor.

Monasteries became largely responsible for brewing and improving beer in Europe. Beer was also made in the home (almost always by women) throughout Europe. In Medieval cities, rivers were typically undrinkably polluted. Many chose to take their fluids in the form of beer, which meant that most of the Dark Ages population in Europe was drunk all day.

Our average modern beer-drinker may have discovered this and wondered why beer as an all day beverage ever went out of fashion. As fun as it may sound, drinking pint after pint every day isn't known for having a stimulating effect on productivity and inventiveness. Perhaps this is why the Arab world was far ahead of Europe in new developments during the Dark Ages; in the Middle East, instead of beer people drank coffee all day. When the coffee bean finally made its way to Europe, the Industrial Revolution followed.

The History of Coffee

From Frisky Goats to Weasel Poop

Ethiopia is in fact the country of origin for coffee. The earliest date for cultivation was probably the sixth century. One legend tells of a goat herder who watched as the goats ate the strange red berries. He noticed that they had unusually high energy after eating the berries, and so tried the berries himself. He was so amazed by the energy the beans gave him that he spread the news of the remarkable plant far and wide.

The berries from the *Coffea arabica* bush were eaten whole in the early years of coffee consumption. Early caffeine-a-holics also ground up the berries with fat to make a paste, or sometimes infused the whole fruit. The stuff we might actually recognize as coffee was first created in the 1200's—the beans were cleaned and roasted before infusing.

Coffee first became popular among a specific sect of Muslims called dervishes. Their devotions included lots of whirling around until they became cataleptic (catalepsy: a condition characterized by lack of response to external stimuli and by muscular rigidity, so that the limbs remain in whatever position they are placed). The caffeine increased the amount of whirling they could do before reaching catalepsy, and so was very popular.

The love of coffee spread. The first coffee house was established in Constantinople in 1554. Europeans were introduced to the sleep-less aid in the 1600's. England got its first coffee house in 1650. A number of cities in Europe followed suit in the next few decades. However, no one grew the *Coffea arabica* bush outside of the Near East until the Dutch discovered in 1720 that it could be grown in Java.

Today, most of us recognize South America as the place to grow coffee. Five million people in Brazil alone, and more than 20 million worldwide, are employed in the coffee industry. Over 400 billion cups of coffee are consumed around the planet every year.

The most expensive coffee you can buy is called Kopi Luwak. It is produced in Indonesia by first allowing a weasel-like animal called the civet to eat the raw beans. Then, the animal's feces are collected which contain partially digested coffee beans. These beans are then used to brew Kopi Luwak coffee. The animal's digestive system apparently removes the bitterness in coffee as well as adding its own special distinct flavor.

The History of Popcorn America's Favorite Fluffy Snack

Corn is native to North America, and was used by Native Americans in many ways.

Perhaps the most popular and beloved form of corn (or maize) is popcorn. In fact, it may be the oldest use of corn. The oldest discovered popcorn is estimated to be about 4,000 years old and was found in the so-called Bat Cave in New Mexico. One method the ancient Native Americans used to pop the corn was to stir corn kernels into heated sand. According to Spanish accounts, popcorn was used in a number of Aztec ceremonies as decoration and adornment. Of course, it was also used for food.

Native Americans told a folktale that said that popcorn popped because spirits lived in each kernel. Usually content and peaceful, these spirits would get angry if their houses were heated. As their houses got hotter and hotter, the spirits got angrier and angrier, until they burst out of their kernel with a puff of steam.

The moldboard plow led to widespread planting of corn in America in the mid-1800s. It became very popular in the 1890's and stayed popular until the Depression, when popcorn became a luxury many *could* afford. The snack's popularity shot way up. Popcorn businesses succeeded where most other kinds of businesses failed. This situation continued into World War II, when the U.S. suffered a sugar shortage. Since popcorn needs no sugar, its consumption in the U.S. tripled during the war years.

The popularity of popcorn fell in the late 1940's when TV came into the home—people weren't eating popcorn in movie theaters anymore. Once home microwaves and microwave popcorn appeared on the scene, consumption boomed again.

II. The People

The Personal Failures and Public Triumphs (or Vice Versa) of Milton S. Hershey

Part One The Early Years

Milton S. Hershey was born in 1857 in central Pennsylvania. His parents were both Mennonites, but often did not see eye to eye. Fanny was devoted to her traditional way of life while Henry was a bit more liberal. He was a dreamer who invested in finding oil in Pennsylvania, tried to write fiction, farmed, and built dams. The one thing all his pursuits had in common was their result for Henry--complete financial failure. Henry wasn't the sort of man to have his spirits lowered by such small matters, but Fanny was not so light hearted. She despised his "frivolous" way of living.

The Hershey family was broke through the 1860's. Milton would sell berries door to door and the whole family would sell brooms and butter from a wagon. In addition to financial troubles, Henry and Fanny fought constantly. They fought over Milton's education, which meant that he was sent to many schools, ending up barely able to read. Milton was always pulled between his two parents—his mother struggled to teach him the value of hard labor, while Henry wanted him to be more freethinking. In 1867, Milton's sister died of scarlet fever, which was all Henry's fault according to Fanny. So, Henry was thrown out. After a couple of failed career attempts, Milton was apprenticed to a confectioner. This suited his interests and was good enough for Fanny.

Milton worked for four years, then, at age 19 he started a taffy business. The shop soon employed nine people (including Fanny). Henry showed up in town in 1880, talked Milton into greatly expanding his business, which drove Milton to borrow more and more money from relatives (on his mother's side). Eventually, they refused to give him any more money while he was in business with Henry. Milton refused to choose between his parents, and the stress drove him to a mental breakdown. Henry decided to sell his son his half of the business and go out west to mine silver. Milton's business collapsed anyway. He followed Henry west to try and make back the money he owed his family.

He ended up working with another confectioner in Denver. This man had a secret for better caramels—using milk to make them chewy instead of paraffin. Milton later moved to Chicago and started another business with his dad making caramels and cough drops. In 1883, Milton went to New York without his father and started his own caramel shop. Henry followed, again convinced his son to grow his business too quickly, and again caused financial collapse. Milton returned to Pennsylvania. His mother's side of the family was beginning to think of him as just another Henry. But, they gave him one more chance.

His mother and aunt helped him start another business, with the condition that his father could not be involved. He had limited success—he did well selling the caramels around town, but didn't have enough money to expand any further. His family would not lend him any more money. In 1887, an Englishman offered to sell the candies in London if Milton could produce enough to make it worthwhile. Only one banker would lend him money. But when the note was due, Hershey still couldn't pay. The banker, who must have been blessed with highly accurate intuition, decided to lend him even more money.

**The Personal Failures and Public Triumphs
(or Vice Versa)
of
Milton S. Hershey**

**Part Two
Hershey, Pennsylvania**

Hershey's first fortune was made from caramel. It took a couple of failed businesses, a generous and gutsy banker, and a highly popular caramel recipe perfected by Hershey, but he became a multi millionaire by the age of 33. However, thanks to his creative personality, he sold his caramel empire and dove into the exciting world of chocolate. Hershey hated running businesses, but loved creating them. So, in 1900 at the age of 43, Hershey sold most of his caramel business to focus on developing his chocolate dreams.

Hershey first saw chocolate being made at the 1893 Columbian Exposition in Chicago—an event much like the future world's fair. He was immediately intrigued, and bought the whole chocolate maker's display at the Exposition. With this equipment, Hershey expanded his caramel products to include new chocolate products. He enjoyed experimenting with the chocolate line so much that he decided to use all of the money (\$1 million) from the sale of the caramel business to create a chocolate utopian town—the future Hershey, Pennsylvania.

Despite the fact that pretty much everyone thought he was crazy for trying, Hershey went ahead with his plan for the chocolate town. He picked a spot in the heart of dairy country before he, or anyone else in the United States, even knew how to make milk chocolate. Hershey broke ground on March 2, 1903, before he had perfected his own milk chocolate recipe through trial and error. The whole town of Hershey was built before one Hershey milk chocolate bar was ever produced. The immense modern factory was waiting nearly empty while Hershey still tweaked

his formula. Shortly thereafter, Hershey found his recipe, and by 1907 sales had reached \$2 million.

**The Personal Failures and Public Triumphs
(or Vice Versa)
of
Milton S. Hershey**

**Part Two and a Half
What's the Big Difficulty With Milk Chocolate?
and
Why do Europeans Think Hershey Chocolate Tastes Spoiled?**

In a nutshell, milk is mostly water and chocolate is mostly fat. They don't like to mix. In order to get the two to commingle, the milk must first be dried. Once the water has been driven off, the other ingredients—sugar, cocoa butter, cocoa powder, chocolate liquor, etc. must be mixed together in the right order (which is what gave Hershey so much trouble). The recipe for milk chocolate had already been worked out in Europe, but it was a closely guarded secret. The Swiss made chocolate that tasted a little different from British chocolate, and the Italians made their chocolate a little different than in Britain or Switzerland because no one was willing to share their recipe. So, when Hershey finally struck on a formula that worked, it tasted like no one else's. The signature Hershey flavor is really slightly sour milk, due to the way Hershey condensed his milk. The exact recipe he worked out is still guarded.

**The Personal Failures and Public Triumphs
(or Vice Versa)
of
Milton S. Hershey**

**Part Three
Milton Hershey, the Man**

After he bought Fanny a house in Pennsylvania, Hershey decided to see the world. Hershey loved to travel. He would sometimes stay abroad for months at a time. He filled his house back home with expensive collections from faraway countries. Perhaps his favorite part of life was his wife Kitty. She was very different from his Mennonite family. She liked fashion, threw parties, and went to the theater. Fanny, of course, hated her. Hershey's marriage to Kitty was the sign that he had abandoned his family traditions.

While he was actually attending to his business, he liked to concoct new confections and hold contests among the employees to name the new treat. He would also instruct the workers on how to work with the product, showing them how to knead caramel, test syrup, or fix mistakes. He loved working alongside his employees.

He also attempted to reconcile his parents by buying the old Hershey house and inviting his parents to live together. Henry had never made a success of himself, and so moved in promptly. Fanny eventually moved into the same house, but would never truly reconcile with her husband—she barely even spoke to him. Hershey's only triumph in this area was to convince her to stop calling herself a widow. The day Henry actually died, Fanny took all the books in his library and burned them.

**The Personal Failures and Public Triumphs
(or Vice Versa)
of
Milton S. Hershey**

**Part Four
The Denouement**

The town of Hershey, Pennsylvania was such a success that millions of people came to visit every year. It was such good publicity that Hershey didn't even need advertising. The town included an orphanage to which Hershey was devoted. The boys (and eventually girls) of the orphanage got everything Hershey did not have as a child—security, stability, education, vacations, spending money, and help finding a job or a scholarship to college upon graduation.

In 1910 Kitty was diagnosed with an incurable nervous condition. Hershey took her to clinics around the world, but Kitty died in 1915 at the age of 42. Shortly thereafter, Hershey donated his entire estate to the Hershey Trust to be used for the school/orphanage. The program had been Kitty's idea in the first place. Hershey was only 61 when he gave away everything. Today, the gift is worth about \$5 billion and the students typically come from inner-city neighborhoods.

Most of the 1920's and 1930's saw Hershey in the Caribbean. Fanny often joined her son there until she died in 1920. Hershey established a school similar to his Pennsylvania school in Cuba after he bought much land there for sugar production. Hershey was given a huge honor in 1933 for his contribution to the Cuban economy (his sugar mills employed 4,000 people in Cuba).

When the Depression struck the nation, residents of Hershey were hardly aware of it. No employees were discharged and no wages were cut. Actually, Hershey spent about \$10 million in expansions to the town in the early 1930's. Even though sales were cut in half during this

time, the company did fairly well due to the drop in sugar and cocoa prices. However, the town still experienced a labor movement, which led to strikers taking over the factory. This devastated Hershey.

Hershey spent the last years of his life experimenting in irrigation, soil conservation, and new ways to produce chocolate. He wanted non-dairy ice cream to ensure that his students would always have ice cream during the rationing of WWII. He created a fake ice cream so good he couldn't sell it for fear of damaging Pennsylvania's precious dairy industry. He also tried to produce soap from cocoa butter, which was a flop.

Milton Hershey died on October 13, 1945 at the age of 88. The town Hershey and surrounding areas closed schools and businesses on that day. His body lay in state for three days in the foyer of the Industrial School, where thousands of people came to pay their respects. Flowers overflowed to the outside of the building, and 1,600 people attended the funeral. The funeral procession extended for two miles to the Hershey cemetery.

The Chocolate Planet Mars

Part One Frank Mars Makes it BIG

The remarkably successful candy company Mars Inc. was started with one important ingredient: polio. Frank Mars contracted polio at a very early age and so, when most boys would have been outside playing, Frank was stuck inside with his mother. He took an interest in cooking, especially candy making. As he grew older, he mastered all of his mom's recipes and began to make his own. He started his own candy company in 1902. His son, Forrest Mars, was born in 1904. Frank's business went bankrupt pretty quickly, leaving his family destitute. Frank's wife Ethel divorced him in 1910 because he could not support her or Forrest. Frank was ordered to pay alimony (but he never did). Ethel's parents took care of Forrest while she took a job to support herself. Meanwhile, Frank started another company—which also went bankrupt. So, he decided to start another company—which also went bankrupt. After the third failed business, Frank sunk his last \$400 into a new company in Chicago he called Mar-O-Bar, after his candy bar invention, and finally had success. Frank's business steadily increased. He was now remarried (to another woman named Ethel) and had three children. He was a successful businessman when he bailed Forrest out of jail in 1923, seeing him for the first time since the divorce with Ethel #1.

The Chocolate Planet Mars

Part Two Forrest and Frank

Forrest Mars grew up constantly reminded by his mother to do better than his father (her special nickname for Frank was “that miserable failure”). He did well in school, earning a partial scholarship to the University of California at Berkeley. However, his entrepreneurial instincts took over and he cancelled most classes to focus on working in the school cafeteria—which he made lucrative by showing the school cook how to incorporate meats he could buy at a discount. He worked for Camel cigarettes when school was out. Forrest was arrested after an aggressive marketing stunt annoyed law enforcement officials (he plastered every surface on State Street in Chicago with posters for Camel cigarettes).

After Frank and Forrest were reintroduced, rather than bringing up bitter family issues, they stuck to talking business since this was virtually all they had in common. Forrest claims that he gave the idea for the Milky Way bar to his dad by suggesting the delightful nougat addition to the chocolate bar (first introduced in 1924). Nougat is cheaper than chocolate, so by adding it you get a bigger-looking chocolate bar for cheaper. Realizing the potential financial genius inside of himself, Forrest chose to go to Yale to study finance and business. He graduated in 1928, and then went to work for his dad at what was now called Mars, Inc.

By this time, the company was enormously successful. Forrest again claims credit for much of the success, saying that he often reminded his dad to “keep it simple.” In 1930, Frank invented the Snickers bar. In 1932, 3 Musketeers was added to the list of products (again invented by Frank). Although Forrest’s official position in the company was relatively low, he marched around the factory giving orders to the employees and intimidating everyone with

exacting demands. He and Frank fought often about the direction Mars, Inc. should take.

Forrest wanted to expand the business, while Frank was content with its size as it was.

Eventually, in 1932 Frank threw Forrest out with \$50,000 and the foreign rights to Milky Way.

The Chocolate Planet Mars

Part Three Forrest on his Own

Forrest worked for about a year in a Swiss chocolate factory, learning how to make chocolate (Frank always had to buy chocolate—usually from Hershey). After he spied on the Swiss as long as he needed, he moved to England to start his own company. The money he had from his father was not nearly enough to begin a large operation, so Forrest started small. He rented a tiny space and began making candy from the kitchen. In the beginning, he had his wife and son Forrest Jr. with him. His wife took Forrest Jr. and returned to America when he spent all his money on the business and had nothing to feed his family.

Forrest tweaked the recipe for Milky Way to suit British tastes, re-dubbed it the Mars Bar, and had success. Once he had enough business to hire employees, he terrorized the workers by being compulsive about quality. A Mars Bar with not quite enough caramel would send him into a complete rage. Any tiny defect in the product would cause angry fits. Nearly all employees were afraid to deal with him face to face. Despite his temperament, many of his practices and techniques were effective. For example, he got the most out of his workers by linking salaries to company performance. Many of his strategies like this are used today—although hopefully screaming at employees is omitted from modern plans.

While still in England, Forrest also started a pet food branch, which had no competition. Most people fed their dogs table scraps. The pet food line was popular, and still represents a big portion of Mars profits.

Forrest left Britain at the beginning of World War Two, when a special tax was imposed on resident aliens. He left the business with a top British manager and returned to the United

States. Frank had died not long after Forrest left the country, but Mars, Inc. was in control of Ethel #2 and her family. And Ethel #2 was not about to let Forrest back. So, Forrest went to Hershey.

It was 1939 when Forrest showed up in Hershey. William Murrie (Hershey's right hand man) and Frank Mars had been friends and close business associates. It was Murrie who arranged the sale of Hershey chocolate to Frank before he was a success and no other chocolate-maker would agree to sell their product to him. Forrest was in Hershey talking to Murrie because he had a new product in mind and needed a partner—someone who had the connections to supply chocolate for the new inventions. William's son R. Bruce Murrie fit the bill perfectly. William was so impressed by Forrest's product that he immediately told Forrest to talk to Bruce in New York. That meeting was the beginning of Forrest's first successful candy invention—M&M's to stand for Mars & Murrie.

Less than a year later, M&M Ltd. was up and running. Bruce Murrie quickly came to regret his partnership with Forrest. He expected to work for Forrest the way his dad worked for Hershey, managing the business. Forrest instead treated Murrie nothing like a partner. It became obvious that Forrest was only interested in Murrie for his connections. During WWII, most chocolate companies suffered from a shortage of chocolate because so much product was being used for army rations. But William Murrie made sure M&M Ltd. got all the chocolate they needed. Bruce put up with Forrest because he didn't want to disappoint his dad, who thought M&M was a great opportunity for his son. William Murrie just didn't realize that Forrest Mars was nothing like his father. Forrest would berate and humiliate Bruce when sales didn't quite reach expectations (sales was the only area where Bruce was allowed any control). Never satisfied with the amount of new business Bruce was able to come up with, Forrest abused

him until the breaking point. Mars & Murrie had a screaming match in 1949, where Forrest demanded that Bruce go out on the road as a salesman or lose his job. So, Bruce finally quit. Forrest bought out his part of the company for \$1 million.

In 1945, Ethel #2 died. As Frank's original will stipulated, half her stock passed to Forrest. He finally had a foothold in his dad's company. He used this to fight the man currently in control of Mars, Inc, William Kruppenbacher (Ethel #2's half brother). They fought over everything. When Forrest was allowed to see the company's books he used it to keep track of current management. He would berate the board of directors and Kruppenbacher continually over minor issues. After Forrest's failed attempt to convince the board to throw out Kruppenbacher, he was banned by Kruppenbacher from the factory's grounds. Forrest sued management, even though he knew all the distractions would hurt the company. In 1950 he was given 1/3 of the board's seats, which Forrest used to push the company's expansion through updated machinery. Kruppenbacher retired in 1959, and Forrest convinced the rest of the board to name him chairman (he wanted to be chairman and CEO). Forrest's half sister Patricia (daughter of Frank and Ethel #2) was married to James Fleming, who was named CEO.

Fleming was like Kruppenbacher in that he disagreed with Forrest about everything. But unlike Kruppenbacher, he was lousy at running a business. He was running Mars, Inc. into the ground. Patricia realized this, but had brain cancer and so could not fix the situation herself. She decided to sell her shares to Forrest. This meant that Forrest held 80% of the company himself. Fleming sold his 20% to Mars quickly. So in December of 1964, at the age of 60, Mars Inc. was completely in the hands of Forrest Mars. After he took over, only the products remained the same.

One of the first things he did was figure out a way to stop depending on his competitor, Hershey, for his supply of chocolate. Unlike his dad, Forrest saw Hershey as a threat rather than a partner. Hershey was stunned by Forrest's announcement that he would be phasing out his purchases. At the time, Mars was Hershey's biggest customer of chocolate coating and the loss of the business from Mars hurt Hershey. Forrest also went about completely mechanizing the production of his candy bars, making his operations super-efficient. He was obsessed with eliminating sloppiness, waste, and clutter. Within three years, most top executives left to work for other food companies.

Some even went to Hershey. Mars' top competitor was still quite backwards when it came to tracking sales, and knowing where their products were selling well and where they were falling behind. Some of the executives who defected from Mars went over to Hershey and helped the chocolate giant become more modern in marketing and sales. The Hershey way of doing things had always been very low key, and focused on getting "orders," no matter how big or small. Forrest's abrasive style drove away some top people, who in turn helped Hershey stay in the game with the mega-productive, mega-efficient chocolate company that Mars was becoming.

The Chocolate Planet Mars

Part Four Forrest and Parenting

Forrest's parenting style seemed to be much like his management style. When his daughter Jackie fell in love with horses, but did not get 1st place in her competition, Forrest took her horse away. Meals were the time for examining his three children's performance in school, their friends, or anything else. Even today, Forrest's sons and daughter avoid sitting down for a meal. Going off to prep school and away from home was a relief to the children. They were never even given a single M&M growing up, because according to Forrest, he "couldn't spare any." Forrest raised his children as if they were always on the verge of poverty. Yet he did prepare his sons Forrest Jr. and John to someday run the company, but not his daughter. Jackie was never encouraged by Forrest to take an active role in Mars, Inc. In 1973, Forrest turned the company over to his children, giving them each exactly 1/3 ownership.

Hershey and Mars

If ever you were searching for the ideological antithesis to Milton Hershey, you would find it in Forrest Mars. For every utopian and idealistic idea Milton Hershey ever had, Forrest Mars had three ideas to improve efficiency, productivity, or profit from his business. Where Hershey saw the possibility of a better life or community, Mars saw an opportunity for business expansion. Hershey hated running the details of his factories, but Mars thrived on developing policies to maximize profit. While Hershey was seen as a rather paternalistic (if sometimes overbearing) figure around Hershey, Pennsylvania, Mars was a feared man in his factories thanks to his demanding manner.

However, the two men did have one thing in common—a troubled early family life. Forrest's mom Ethel divorced Frank Mars when he sunk all his money into starting new businesses, leaving nothing to support his own family. Frank remarried and didn't even see his oldest son between babyhood and adulthood. Hershey's mom was way too traditional to ever divorce, but she had similar problems with her husband. The separation between his parents was a disappointment to Hershey his whole life. Forrest Mars was spurred on to success by his mother, who constantly goaded him to be better than his father. Hershey had clearly hoped that his material success could reunite his parents, but his success was extremely limited. Hershey and Mars both inherited something that allowed them to become the successful men that are known today—Hershey got his dad's idealism and try-anything-once sort of attitude, while Mars got something a little more material from his old man.

Yet the difference between the men were more numerous and more important than their commonalities. Milton Hershey and his wife Kitty would have given anything to have a child,

which is the main part of the reason they doted on the children in the orphanage/school Hershey founded. Mars, of course, had three children to whom he never showed affection. These differences carried over into their companies. Hershey encouraged his sales force to just go out and get an order from anybody, and let him worry how the company would stay afloat. Mars, on the other hand, made sure his salesmen never forget for a moment that profit was always everyone's goal.

While a troubled family life probably played a part in turning Hershey into the big softie that he was, Mars was instead driven to become a demanding and verbally abusive, but very brilliant, man.

The Father of...Canning Nicolas François Appert

Born in 1750, Appert was a chef and confectioner before developing the canning method of preserving foods. In the late 18th century, Napoleon offered a 12,000 franc reward to anyone who could invent a method to preserve food for his army to take on the march. Appert won this prize in 1809 by sealing foods in glass jars and boiling them for whatever time he deemed appropriate. The next year, Pierre Durand copied this method using tin cans instead of glass jars. Appert used his prize money to open the first commercial cannery called the House of Appert.

The reasons behind the success of canning would not be completely understood until Pasteur made his discoveries about the effect of heating on microorganisms and food spoilage.

The Father of... Microbiology Louis Pasteur: one of several supposed fathers of microbiology

Pasteur was born in France in 1822. His most notable achievement was the preservation of milk and wine through a heating technique called pasteurization—he developed this once he discovered that heat kills microorganisms and that microorganisms cause spoilage. He discovered this by putting boiled broth in flasks with either a filter or kind of tube that prevented dust from reaching the broth. The samples that were protected from entering dust (and all the stuff that comes with it) had no growth, which proved germ theory and finally disproved the theory of spontaneous generation.

The discovery that microorganisms cause contamination in drinks caused Pasteur's intuitive leap to the idea that microorganisms cause human and animal illnesses as well. He worked with chicken cholera, anthrax, and rabies. The idea of a vaccine was already known;

Pasteur applied this idea to each of these diseases. He gave the first rabies vaccine to a boy attacked by a rabid dog (after testing it on only 11 dogs). The vaccine was successful and led to vaccines for other diseases.

Pasteur pushed for the creation of a center for rabies treatment, research, and teaching.

This institute was inaugurated in 1888 and called the Pasteur Institute. Pasteur died in 1895.

**Note: Although a number of people have been called the “Father of Microbiology,” the other man most often given this title was Anton van Leeuwenhoek, who liked to look at stuff under microscopes and was the first to describe in detail (among other things) red blood cells (in 1675).*

The Father of... The Pure Food and Drugs Act Harvey W. Wiley, M.D.

Wiley was born on a farm in Indiana in 1844. He was a professor of chemistry by his late 30's—but he did not stay in academic life for long. He gave up being a professor in 1883 to become the chief chemist in the Bureau of Chemistry (the future Department of Agriculture). Many pure food bills were introduced to Congress in the next two decades thanks to Wiley, but none passed. In order to bring more attention to his cause, he decided to organize the “Poison Squad” in 1902. The squad was actually a group of young, healthy men who voluntarily ate adulterated foods and various chemicals to test their effects. Some examples of tested ingredients include borax, salicylic acid, and formaldehyde.

Wiley began to gather support from canners and from the Federated Women's Clubs. In 1906, President Theodore Roosevelt signed the Pure Food and Drugs Act and appointed Wiley to oversee its administration. He stayed at this post until 1912. After quitting his government job, Wiley focused on his work at *Good Housekeeping* magazine.

Wiley used his post at *Good Housekeeping* to continue to fight for pure foods—better meat inspection standards, pure butter without water, whole wheat flour not mixed with other

grains, etc. Wiley also co-wrote an expose on weight loss aids, and wrote a series of articles that contributed to a bill which used Federal funds to provide better infant care. Harvey Wiley died in 1930 at age 86.

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